ABSTRACT

THE EFFECT OF SYSTEM NANOPARTICLE ANDROGRAPHOLIDE – CARBOXYMETHYL CHITOSAN ON IN VIVO ANTIMALARIAL ACTIVITY AT MICE WERE INFECTED BY *Plasmodium berghei*

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Andrographolide is a class of diterpene lactone obtained from the isolation of plant herb sambiloto (*Andrographis paniculata*) which have activity like hepato protector, anticancer and anti-malarial. Andrographolide has low solubility in water, low bioavailability and half-life time is short. One of method used to improve the low solubility of andrographolide is nanoparticle systems. In this study nanoparticle was made by ionic gelation-spray drying method using cross linker ($CaCl_2$). Characterization of the nanoparticle systems was done using SEM, FTIR, DTA, X-Ray Diffraction and *in vivo* antimalarial assay was also evaluated. The result showed that nanoparticle systems with polymer carboxymethyl chitosan has a rough surface and not spherical shape. The result of FTIR showed that nanoparticle systems showed sharper peaks of –OH or –NH at wave number 3434,36 cm^{-1} if compared with peaks of carboxymethyl chitosan. The result of DTA showed that nanoparticle systems with polymer carboxymethyl chitosan has different endothermic peak if compared with endothermic peak of andrographolide. X-Ray diffractogram of nanoparticle systems showed crystalline peak of andrographolide disappear that means crystalline peak of andrographolide was changed. The result of the *in vivo* antimalarial activity of nanoparticle systems andrographolide-carboxymethyl chitosan againts *Plasmodium berghei* has found to have an average inhibition at fifth day is 71,27 ± 6,83% and increased by 1,65 times if compared with andrographolide. *In vivo* antimalarial assay of nanoparticle systems andrographolide-carboxymethyl chitosan higher than andrographolide and showed significantly difference statistically.

Keywords: andrographolide, *in vivo* antimalarial assay, ionic gelation, spray drying.